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THE UNIVERSITY OF ALBERTA

AN EXPERIMENTAL COMPARISON OF THE RELATIVE EFFECTIVENESS OF TWO METHODS OF TEACHING THE SOCIAL STUDIES IN GRADE ELEVEN (1960)

by

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ABSTRACT

This comparison of the relative effectiveness of the lecture and socialized-recitation methods of teaching social studies was conducted in Ross Sheppard Composite High School, Edmonton. Results were reported from four Grade eleven classes of average or below average ability for this high school. The students were homogeneously grouped, therefore a rotational experiment design was used, instead of matched experimental and control groups.

The effectiveness of the two methods was compared by measuring the change in scores of tests written by the students before and after the experiment. The experiment was concerned to measure the relative effectiveness of the teaching methods in three areas: (1) for teaching facts, (2) for developing understandings, and (3) for influencing attitudes.

The gain scores obtained from the examinations were tested for significance in the difference of means. A two-tailed t-test, at the .001 level of confidence, was used for rejecting the null hypotheses that there was no significant differences between the two methods in the first two respects being tested. The .05 level of confidence was used in the attitude comparison.

The conclusions of the experiment were that lecturing was significantly better than the socialized-recitation for teaching facts in the social studies, although this confidence level depends upon assumptions about the experimental design. There was no significant difference between the two methods for developing understanding.

Students' attitudes were influenced differently in four of the six ways in which they were investigated. Socialized-recitation produced a greater tendency among students to agree with the ideas of the economic and political left wing, whereas lecturing generally produced a slight change to the right. However, the differences were not large enough to be significant at the .05 level.

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CHAPTER I

BACKGROUND AND NEED FOR THE STUDY

Introduction

The high school teacher of social studies in Alberta has the responsibility for determining the methods of classroom instruction. The Department of Education indicates the general content of the high school social studies,[1] and suggests certain teaching methods which have been found to be effective.[2] The desired outcomes of education, in knowledge, skills, and attitudes, are specified by the Department.[3] Within these limitations, the teacher is free to choose the methods of instruction, using his own experience as a guide, and interpreting the conclusions of others from reports in educational literature.

Statement of the Problem

The major problem of this study was to determine whether the lecture or the socialized-recitation would prove to be more effective for teaching social studies in Alberta high schools.

Statement of Sub-Problems. The sub-problems of the experiment were concerned with three aspects of teaching effectiveness:

1. Would factual information be learned more thoroughly by students taught by the lecture or by the socialized-recitation method?

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[1] Senior High School Curriculum Guide for Social Studies 10, 20, and 30 (1955), Province of Alberta, Department of Education, pp. 23-128.

[2] Ibid., pp. 17-18.

[3] Ibid., pp. 7-12.

2. Would concepts associated with the subject matter be more thoroughly understood by students when taught by the lecture of by the socialized-recitation method?

3. Would attitudes toward viewpoints associated with the subject matter be influenced more by the lecture or by the socialized-recitation method?

Need for the Study

The need for this study is derived principally from five main shortcomings of educational literature available to Alberta social studies teachers. One shortcoming is that most of the studies report on subjects different from the Alberta social studies. The teacher must then try to determine which of the available conclusions would probably apply to his teaching situation.

Secondly, there is very little pedagogical information readily available to Alberta social studies teachers. An examination of the A. T. A. Magazine[1] since 1950 revealed no studies of this nature. Only one thesis,[2] written by Mix in 1954, was available at the University of Alberta.

Thirdly, the literature on social studies does not report uniform conclusions. A review of opinions about the relative merits

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[1] The A. T. A. Magazine, the official organ of the Alberta Teachers' Association, Edmonton, Alberta.

[2] Louis C. Mix, "An Experimental Comparison of Two Methods of Teaching Unit Two of the High School Social Studies 20 Course (1952)" (unpublished Master's thesis, University of Alberta, Edmonton, 1954).

of lecturing and socialized-recitation, which were the two methods compared in this study, revealed opposite conclusions. For example, Delaney held that lecturing was a very useful and important method of instruction, not used frequently enough, and unwisely neglected in teacher training,[1] but Moffatt limited his approval of lecturing to extended replies to pupils' questions.[2] Bining and Bining offered a neutral viewpoint, and suggested that informal presentation of material, when it was not easily available from other sources, was among the acceptable reasons for lecturing.[3] They would probably support Delaney's contention. Mix reported that lecturing was significantly superior to socialized-recitation for imparting facts,[4] that it was faster,[5] and that there was no significant difference between the two methods for developing understanding.[6]

A fourth shortcoming of the available studies is that the influence of different methods upon the students' attitudes has not been very accurately determined. Mix used an 'open-end' question to

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[1] Arthur A. Delaney, "Don't Downgrade the Lecture", The Clearing House, XXXV:285-86, January, 1961.

[2] Maurice P. Moffatt, Social Studies Instruction: Organizing, Teaching, and Supervising the Social Studies in Secondary Schools (Englewood-Cliffs, N.J.: Prentice-Hall and Company, 1954), p. 148.

[3] Arthur C. Bining and David H. Bining, Teaching the Social Studies in Secondary Schools (New York: McGraw-Hill Book Company Inc., 1952), pp. 72-73.

[4] Mix, op. cit., pp. 65-66.

[5] Ibid., pp. 68-70.

[6] Ibid., pp. 66-67.

ascertain which teaching method was better liked by the pupils,[1] but he did not study the effect of the teaching upon the students' attitudes toward social queations.[2]

A fifth shortcoming is that uniformity on the aims of education, and in particular on the aims of social studies teaching, is lacking. Many of the writers in the social studies have discarded the traditional disciplines and the emphasis on factual material allegedly associated with them. Bining and Bining, for example, were of the opinion that

> . . . The search for knowledge, together with its conservation and distribution, is not the chief aim. Instead, the most prominent of the objectives of the secondary school is the training of pupils for effective citizenship. The materials of the social studies provide the basis for making the world of today intelligible to the pupils, for training them in certain skills and habits, and for inculcating attitudes and ideals that will enable boys and girls to take their places as efficient members of a democratic society.[1]

Gross and Ovard stated that the present culture should be analyzed to determine its aims and objectives, and that these aims should come from the needs of the individual and from society, not from the traditional disciplines.[2]

Samford and Cottle considered that aims and objectives are much more related with developing desirable attitudes, skills, and understandings, than with mastery of facts. They stressed that so many facts are available for present education that a very careful choice, based on illustration of principles, is imperative.[3]

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[1] Bining and Bining, op. cit., pp. 3-4.

[2] Richard E. Gross and Glen F. Ovard, "A Review of Aims and Objectives in Social Education," The Social Studies, LI, 5:170-73.

[3] Samford and Cottle, op. cit., p. 68.

The National Society for the Study of Education concluded that three areas must be covered: (1) acquiring functional information; (2) analyzing social problems; and (3) practicing desirable social relationships.[1]

Other authorities, concerning themselves with the problems of education in general, dealt with the social studies as a part of their larger discussion. Conant gave three main objectives for the comprehensive high school:

> . . . first, to provide a good general education for all the future citizens; second, to provide good elective programs for those who wish to use their acquired skills immediately on graduation; third, to find satisfactory programs for those whose vocations will depend on their subsequent education in a college or university.[2]

Whitehead stressed the unity of all knowledge, and urged the eradication of the "fatal disconnection of subjects which kills the vitality of our modern curriculum."[3]

In short, the emphasis of these writers is on the development of attitudes, skills, and understandings in addition to the mastery of facts. Their approach would indicate that methods in the social studies should be selected with these purposes in mind.

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[1] National Society for the Study of Education, The Measurement of Understanding (Chicago: University of Chicago Press, 1946), pp. 71-80.

[2] James Bryant Conant, The American High School Today (New York: McGraw-Hill Book Company, Inc., 1959), p. 17.

[3] Alfred North Whitehead, The Aims of Education (New York: New American Library, 1949), p. 18.

These five shortcomings in the educational literature suggest that studies of social education consider several factors, and report their conclusions in terms of the hypotheses investigated, instead of in general terms. The present experiment compared the two teaching methods in three ways: (1) relative effectiveness for teaching facts; (2) relative effectiveness in developing understandings; and (3) relative effect upon students' attitudes.

Changes in high school education in Alberta have also created a need for the study. The Royal Commission of Education in Alberta reported a marked increase in the proportion of students attending secondary schools.[1] Alberta high schools have become larger, and composite organization is used in most city schools.[2] Cheal assumed that many of the students now attending composite high schools, and taking non-matriculation courses, would not formerly have continued their secondary education.[3]

The extent to which secondary education is general and unrestricted may have influenced the choice of teaching methods. The relationship between these two variables has not been clearly established, although arguments about appropriate methods have generally been couched on

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[1] Donald Cameron, *et al.*, *Report of the Royal Commission on Education in Alberta* (Edmonton: The Queen's Printer, 1959), p. 39.

[2] John E. Cheal, "Role Conflict in the Principalship of the Composite High School: (unpublished Master's thesis, University of Alberta, Edmonton, 1958), pp. 1-2.

[3] *Ibid.*, pp. 2-3.

certain implicit assumptions about organization, and would be valid only where the underlying assumptions prevail.

Conant, for example, believed that social interaction was a desirable element of social studies teaching. He recommended, therefore, that heterogeneous grouping be used for this subject, although he favored homogeneous classes for all other subjects.[1] Moffatt agreed that heterogeneous grouping was associated with social studies,[2] and many of his discussions about teaching methods are apparently couched upon this assumption. For example, he argued that socialized-recitation provided for individual differences.[3] Bining and Bining indicated that individual differences presented both an opportunity and a challenge to socialized-recitation.[4] Although they suggested that the lecture was appropriate for providing material of suitable difficulty,[5] Bining and Bining made no other mention of its providing for individual differences. Samford and Cottle expressed similar opinions.[6] These writers apparently considered that lecturing offered less provision for individual differences than was desirable. However, large Alberta high schools have begun to adopt some form of homogeneous grouping of students within the school.[7] Therefore, individual differences in the classroom would probably be

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[1] Conant, op. cit., pp. 74-75.

[2] Moffatt, op. cit., pp. 63-81.

[3] Ibid.

[4] Bining and Bining, op. cit., pp. 141-42

[5] Ibid., pp. 72-73.

[6] Clarence D. Samford and Eugene Cottle, Social Studies in the Secondary School (New York: McGraw Hill Book Company, Inc., 1952), p. 221.

[7] The school in which the experiment was conducted used the form of homogeneous grouping outlined in Chapter IV.

reduced, and a different teaching method might become appropriate. For example, under these circumstances, the advantages of lecturing might outweigh the disadvantage of providing material best suited to homogeneous groups.

Mix performed his experiment with heterogeneously grouped classes.[1] No Alberta study was found which compared the effectiveness of lecturing and socialized-recitation with students homogeneously grouped.

Experimental Design

The homogeneous grouping of students within classes in the school used in this experiment prevented the use of matched experimental and control groups. Therefore, the rotational grouping outlined by Best was used.[2] Data were obtained by measuring score changes from a pre-test to a post-test.

Basic Limitations of the Study

Classroom experiments in teaching methods are handicapped by an obligation to adhere to regular procedures.[3] In this study, the two most important limitations were those resulting from the prescribed content, and the difficulty of effecting the assignment of teachers and pupils to specific classes. The subject matter taught during the experiment was confined to Social Studies 20, Unit II and Unit V.[4]

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[1] Mix, op. cit., pp. 37-41.

[2] John W. Best, Research in Education (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1959), pp. 129-30.

[3] Ibid.

[4] Curriculum Guide, op. cit., pp. 74-79, 95-104.

The two methods selected for comparison were among those suggested by the Social Studies Curriculum Sub-Committee of the Department of Education.[1] The methods were compared for teaching content and developing understanding and attitudes suggested as objectives in the Curriculum Guide for Social Studies.[2]

The five teachers conducting the experimental teaching were selected because each was familiar with the Social Studies 20 course, and with the organization of the school; and each had five or more years of university training. The author hoped that the information secured would be representative of typical results for similar classes under prevailing conditions in Alberta composite high schools.

Hypotheses to be Tested

In this study, the relative effectiveness of the lecture and socialized-recitation as methods of teaching the social studies was determined by testing three main hypotheses:

1. There is no significant difference in the relative effectiveness of the lecture and socialized-recitation as methods for teaching facts in social studies.

2. There is no significant difference in the relative effectiveness of the lecture and socialized-recitation as methods for developing understanding in social studies.

3. There is no significant difference in the relative effectiveness of the lecture and socialized-recitation as methods for influencing students' attitudes toward the political left or right.

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[1] Ibid., pp. 17-18.

[2] Ibid., pp. 7-11.

The third hypothesis was further subdivided to test students' attitudes for significant differences in each of the following areas:

(a) sympathy toward the labor movement,

(b) approval of government regulation of income size,

(c) approval of government regulation of business activities,

(d) approval of state intervention in health, family control, or immigration patterns,

(e) preferential or discriminatory treatment by employers.

SUMMARY

The need for the experiment was indicated by a lack of conclusive studies on teaching methods, and by recent changes in the organization of large Alberta schools. The experiment was designed to compare the relative effectiveness of the lecture and the socialized-recitation methods for teaching social studies in Alberta schools. The two methods were compared for presenting factual information, for developing understanding, and for influencing attitudes. The subject matter taught was Social Studies 20, Unit II and Unit V. The experiment was of rotational design, using the change in pupils' scores from a pre-test to a post-test to furnish data for the comparison.

CHAPTER II

DEFINITION OF TERMS AND EXPERIMENTAL METHODS

Introduction

In reviewing the literature on the social studies, no attempt was made to trace the development of the subject historically. Instead its present status was clarified by investigating the definitions and descriptions of the social sciences, the social studies, and the 'traditional disciplines'. The desired aims of the social studies were then reviewed. The unit organization of the subject matter and its effect upon teaching methods was studied. Finally, the lecture and socialized-recitation methods of teaching, which were used in this experiment, were also reviewed.

The Social Sciences. The Encyclopedia of the Social Sciences has defined the social sciences as "those mental or cultural disciplines which deal with the activities of the individual as a member of the group".[1] Bining and Bining have defined them as "those subjects that relate to the origin, organization, and the development of human society, especially to man in his associations with other men".[2] The term 'science'

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[1] Edwin R. A. Seligman (Editor), Encyclopedia of the Social Sciences (New York: The Macmillan Company, 1930), I, 3.

[2] Arthur C. Bining and David H. Bining, Teaching the Social Studies in Secondary Schools (New York: McGraw-Hill Book Company, Inc., 1952), p. 1.

implies a scholarly and systematic organization of knowledge, generally capable of being verified by empirical evidence. In the social sciences, unlike the physical sciences, it has been difficult to form and test theories, partly because human variables, such as motivation and value judgments, have intervened.[1] Samford and Cottle have listed the major social sciences as history, geography, economics, sociology, philosophy, political science, anthropology, and jurisprudence.[2] These component subjects of the social sciences may be regarded as the traditional disciplines.

The Social Studies. Moffatt defined the social studies as

> . . . knowledge drawn from the social sciences and contemporary life for instructional purposes in aiding the youth to understand the growth of modern civilization. The social studies field is that area which aids youth through sound knowledge, information, and functional experiences which are essential to the building of basic values, desirable habits, accepted attitudes, and worthwhile skills to basic citizenship.[3]

Bining and Bining confirmed this definition, and regarded the social studies as the adaptation of facts, concepts, and ideals from the "pure" disciplines of the social sciences to the classroom.[4] Samford and Cottle indicated that the social studies is characterized by teaching principles

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[1] Ibid., p. 2

[2] Clarence D. Samford and Eugene Cottle, Social Studies in the Secondary School (New York: McGraw-Hill Book Company, Inc., 1952), p. 68.

[3] Maurice P. Moffatt, Social Studies Instruction: Organizing, Teaching, and Supervising Social Studies in Secondary Schools (Englewood Cliffs: Prentice-Hall, Inc., 1954), p. 12.

[4] Bining and Bining, op. cit., p. 3.

which are important to an understanding of today's world, and by drawing upon history or current situations to illustrate these principles.[1]

In Alberta, the social studies is described as a single body of content prepared from the separate disciplines of history, geography, civics, economics, and sociology.[2] It represents a body of related facts, chosen so that the underlying principles or ideas, and desirable attitudes of scholarship and citizenship can be developed by the teacher.[3]

Descriptions of the Methods Used

The Unit Method. *The Curruculum Guide for Social Studies 10, 20, and 30* suggested that a unit organization of material be used for teaching social studies in Alberta high schools.[4] Samford and Cottle have described the unit as an organization of factual material and teaching methods around a central theme, designed to involve the students under teacher guidance, and involving planning, execution of

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[1] Samford and Cottle, *op. cit.*, p. 69. An example of such illustration was used in this experiment, where economic principles were related to the industrial revolution.

[2] *Senior High School Curriculum Guide for Social Studies 10, 20, and 30* (1955), Province of Alberta, Department of Education, p. 6. For three other ways of organizing the subject matter for social studies, see Ernest W. Tiegs and Fay Adams, *Teaching the Social Studies, A Guide to Better Citizenship* (New York: Ginn and Co., 1959), pp. 52-53.

[3] *Curriculum Guide*, *op. cit.*, pp. 6-20.

[4] *Curriculum Guide*, op. cit., pp. 15-17.

the plan, (learning activity), and evaluation.[1] Jennings claimed that unit organization led to mastery of facts, coupled with a better understanding of the relationships, and their connection with the theme of the unit.[2]

Choice of Experimental Methods. The methods compared in this experiment were the lecture and the socialized-recitation. It was assumed that both methods have been frequently used by teachers in Alberta.

The Lecture Method. The lecture method in the high school has been distinguished from the formal procedure associated with the traditional lecture. Bining and Bining defined the lecture as any occasion on which the teacher imparted information. They said it could be short, in answer to a question, or a part of another teaching method.[3]

Bining and Bining stated that lecturing was subject-matter centered, and therefore most successfully employed for higher education, or in those European schools which combined academically selected pupils, very well trained teachers, and a disciplined atmosphere.[4] They claimed that the lecture could be interesting or even enthralling, and that it was the teacher's job to make it so. They denied that pupils were passive during a good lecture.[5]

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[1] Samford and Cottle, op. cit., pp. 225-26.

[2] Manson Van B. Jennings, The Development of the Modern Problems Course in the Senior High School (New York: Teachers' College, Columbia University, 1950), p. 134.

[3] Bining and Bining, op. cit., p. 64.

[4] Ibid., p. 65.

[5] Ibid., pp. 66-67.

The Socialized-Recitation. The socialized-recitation has been distinguished from the lecture in the attitude of the teacher to the learning process. The latter was not to dominate, but had to establish himself as one of the group involved in a collective effort to solve the problem.[1]

The socialized-recitation could take many forms. At its simplest, it could be a class discussion in which the teacher tried to have the class assume a major responsibility for its direction. The next progression would have a pupil as the chairman. The teacher would remain as the best informed member of the group, but would not dominate the activities with his observations or opinions. Members of the class would present information which they had prepared previously for the consideration of the group. The class would then evaluate the report in terms of the theme of the unit.[2]

Sometimes socialized-recitation would be very "institutional" in form, and could attempt to emulate a town meeting, trial or parliament.[3] In this case, various officials would be elected and a very formal procedure would be used. Bining and Bining concluded that

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[1] Moffatt, op. cit., p. 149.

[2] loc. cit.

[3] Bining and Bining, op. cit., pp. 131-132.

spontaneity in the socialized-recitation was one of its most essential characteristics, and called these institutional approached artificial, and of more value for dramatics than for teaching the social studies.

Although the teacher's task would become more difficult as he apparently withdrew from the active leadership of the group, careful planning would probably result in constructive work. To ensure improvement in the students' mastery of the subject and skill in discussion procedures, the teacher should be prepared to add significant data, to motivate, and to help in evaluating techniques so that improvement would result.[1]

Various advantages have been ascribed to socialized-recitation. Bining and Bining claimed that it enables subject matter to be better used for developing desirable attitudes and ideals.[2] Samford and Cottle indicated that five advantages accrue: (1) the democratic atmosphere assures greater interest and learning; (2) leadership talent is developed; (3) the pupils cooperate to make the venture a

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[1] *Ibid.*, pp. 132-37.

[2] *Ibid.*, pp. 137-38.

success -- class spirit results; (4) former leaders appreciate leadership problems; and (5) knowledge of correct procedures results.[1]

The potential disadvantage of socialized-recitation is that the form, but not the spirit, might be achieved. If a pupil merely replaced the teacher, or if discussions flowed from a desire to please the teacher rather than from interest in the subject, the benefits could be lost.[2] Samford and Cottle discerned five possible pitfalls: (1) pupil-teachers are likely to be less competent; (2) incorrect emphasis may result; (3) leadership talents can be developed in extracurricular activities; (4) time is wasted; and (5) teachers may feel redundant.[3]

Summary of the Two Methods. The key to the difference between the lecture and the socialized-recitation methods would be the role of the teacher. In the lecture, he would be the planner, the initiator, the controller, and the purveyor of information. In the socialized-recitation, he would be an advisor, a contrivor, and a member of the group.[4] Of course, as the position of the teacher was thereby

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[1] Samford and Cottle, op. cit., p. 221.

[2] Bining and Bining, op. cit.., p. 132.

[3] Samford and Cottle, op. cit., pp. 221-22.

[4] Moffatt, op. cit., pp. 149-50.

altered, the students would have to assume a correspondingly increased responsibility for the learning process. On this transition the success of the socialized-recitation would depend.

In the experimental situation, the flexibility of method, which would normally permit a teacher to maintain interest through periodic alteration of his teaching methods, could not be permitted.

CHAPTER III

REVIEW OF RELATED LITERATURE

Introduction

Several studies relevant to this experiment were reviewed. These dealt with lecture or group discussion methods; various types of group leadership; efficiency of various organization procedures, and member reactions to them; and the ways in which group pressures affected the individual.

Several experiments have compared the lecture and some method related to the socialized-recitation. Amidon and Flanders found that indirect teacher influence (corresponding with socialized-recitation) was significantly better than direct teacher influence (lecturing) in gain scores calculated in a pre-test, post-test experiment with dependent-prone students learning geometry.[1] Ward reported three conclusions from his experiment comparing the lecture-demonstration and group methods of teaching first year physical science to college freshmen.

> 1. . . . The group method resulted in longer retained more - understanding type of learning, and also in greater expression of individual differences in such learning on the part of the upper sub-group of the students . . .

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[1] Edmund Amidon and Ned A. Flanders, "The Effect of Direct and Indirect Teacher Influence on Dependent-Prone Students Learning Geometry," Journal of Educational Psychology, LII:286-91, December, 1961.

> 2. . . . The lecture-demonstration method resulted in greater expression of individual differences in longer retained more-understanding type of learning on the part of the lower sub-group of students . . .
>
> 3. . . . The lecture-demonstration method resulted in greater expression of individual differences in longer retained recall-recognition type of learning on the part of the lower three quarters of the students . . .[1]

Ruja compared the lecture and discussion procedures in three college courses using a rotational experimental design. His hypothesis was that the discussion method would prove superior for teaching subject matter, for improving emotional adjustments of the pupils, for improving the relationships between the instructor and the pupils, and for acquainting the pupils with each other. His hypothesis was upheld in the last two cases. The lecture was superior for teaching the facts of psychology. No significant difference in the teaching effectiveness of the methods was found when teaching philosophy. In philosophy, the lecturing proved more effective than discussion for improving the emotional adjustments of the pupils.[2]

Lewin reported three experiments in which the desired outcome was an improvement in food habits. Health authorities compared the relative effectiveness of the lecture and the personal interview on the one hand, with the small group discussion on the other. The latter

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[1] John N. Ward, "Group-Study Versus Lecture-Demonstration Method in Physical Science Instruction for General Education College Students," Journal of Experimental Education, XXIV:197-210, March, 1956.

[2] Harry Ruja, "Outcomes of Lecture and Discussion Procedures in Three College Courses," Journal of Experimental Education, XXII:385-94, June, 1954.

was significantly better than either of the imparting techniques.[1] Lewin claimed that psychologically there is no difference between the lecture and the personal interview because the communication was not affected by other members of the group in the lecture.[2] It proved easier to convince a small group than a single person by either lecture or interview because it was possible to use the group pressure to persuade reticent individuals, and a more optimistic atmosphere could be developed.[3] It was important for the members to identify themselves with the group for these pressures to become effective.[4]

Beach studied the effect upon students' sociability of the lecture, discussion, autonomous small group, and independent study procedures. His conclusions were (1) that all four methods resulted in highly significant gains in knowledge; (2) that unsociable students learned best from lectures; and (3) that gregarious students did equally well by other methods as by lecturing.[5]

Mix found lecturing to be significantly better than socialized-recitation as a means of teaching facts in Social Studies 20 in Alberta

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[1] Kurt Lewin, in Theodore L. Harris and Wilson E. Schwahn, Selected Readings in the Learning Process (New York: Oxford University Press, 1961), pp. 255-60.

[2] Ibid., p. 258.

[3] Ibid., pp. 262-63.

[4] Ibid., p. 262.

[5] Leslie R. Beach, "Sociability and Academic Achievement in Various Types of Group Situations," Journal of Educational Psychology, LI:208-18, August, 1960.

high schools, but that there was no significant difference between the two methods for teaching concepts.[1]

Stovall reported that knowledge was acquired best by the lecture, but that discussion was as good or better in other regards.[2] However, he observed that the variables within either method, considering such factors as topic, students, and teacher, are greater than the evidence of difference between them.[3]

Certain experiments in social psychology offered some possible explanations for some of the relative advantages revealed in comparisons of methods. Lippitt and White compared the effects of autocratic, deomcratic, and laissez-faire leadership of a group. They found that the democratic situation was best liked by a majority of the group members. The laissez-faire was least liked. When the leader was absent, greatest initiative was displayed in the democratic and least in the autocratic groups. Group rapport was highest in the democratic situation.[4]

Skinner, commenting on this study, indicated that in the authoritarian situation

> . . . the members tended to work alone rather than together in small groups; they exhibited antagonistic attitudes toward one another, and though outwardly submissive, acquired strong resentments toward the person in control. The members of the democrat-

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[1] Louis C. Mix, "An Experimental Comparison of Two Methods of Teaching Unit Two of the High School Social Studies 20 Course (1952)" (unpublished Master's thesis, The University of Alberta, Edmonton, 1954), p. 74.

[2] Thomas F. Stovall, "Classroom Methods: Lecture vs Discussion," Phi Delta Kappan, XXXIX:255-58, March, 1958.

[3] *Ibid.*

[4] Ronald Lippitt and Ralph E. White, "An Experimental Study of Leadership and Group Life," compiled from six studies and cited in Guy M. Swanson, Theodore M. Newcomb, and Eugene L. Hartley, Readings in Social Psychology (New York: Henry Holt and Company, 1952), pp. 344-55.

> ically organized group, on the other hand, when encouraged to work out plans cooperatively with the group leader, showed more spontaneous group activity, friendly and constructive relationships, and more wholehearted interest in the task.[1]

The writer inferred from the Lippitt and White conclusions that student attitudes toward the learning situation would probably be more favorable in socialized-recitation than in the lecture situation, because of its more democratic nature. This study, therefore, supported the views of Moffatt, who claimed that socializing any method makes it better at winning student cooperation.[2] The lecture would probably correspond with the authoritarian leadership situation, although the Lippitt and White experiment reported younger persons in hobby situations rather than formal teaching situations.

Leavitt, experimenting to determine the efficiency (in time or accuracy) of groups organized in different ways, found a group to be most efficient when one person made all the decisions, while other group members submitted necessary information and accepted the decision. However, this efficient organization led to dissatisfaction with their tasks for all members except the leaders.[3]

The Leavitt experiment suggested that lectures would be more efficient and better organized than socialized-recitation. However, if students were relatively inactive, they would dislike their role

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[1] Charles D. Skinner, Educational Psychology (New York: Prentice-Hall, Inc., 1951), p. 27.

[2] Moffatt, op. cit., p. 150.

[3] Harold J. Leavitt, "Some Effects of Certain Communication Patterns on Group Performance," cited in Swanson, et al., op. cit., pp. 115-20.

in the learning process. Moffatt claimed that the learner would be relatively passive in a formal lecture,[1] although Bining and Bining maintained that a lecture could actively involve children.[2]

Edmiston and Braddock theorized that pupil attention was a reliable index of how much the students were involved by the learning process, and found that attention ranged (from highest to lowest) through the following range of activities: (1) pupils giving reports; (2) demonstration; (3) general discussion; (4) workbook activities; (5) lecture; (6) rapid-fire questions; and (7) general discussion by the teacher.[3]

Festinger and Thibaut concluded that group activities were especially important in shaping attitudes, because the desire to conform to the social standards of the group was very strong. Furthermore, the greater the deviation of a member from the accepted attitude of the group, the greater would be the social pressure. The pressure increased in proportion to the degree that members identified themselves with the group. It was ineffective upon an isolate.[4] From the

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[1] Moffatt, op. cit., p. 148.

[2] Bining and Bining, op. cit., p. 66.

[3] R. W. Edmiston and R. W. Braddock, "A Study of the Effect of Various Teaching Procedures Upon Observed Group Attention in the Secondary School," Journal of Educational Psychology, 32:670, December, 1941. These findings support those of Lewin reported above, pp. 20-21.

[4] Leon Festinger and John Thibaut, "Inter-personal Communication in Small Groups," cited in Swanson et al., op. cit., pp. 125-34.

Lippitt and White studies, the identification present in the democratic situation appeared to be relatively strong. Bining and Bining believed that such group pressures could be directed in the socialized-recitation and used to develop desirable attitudes.[1]

Certain principles from learning theory and personality theory suggest reasons for the superiority of particular instruction methods. For example, the importance of group membership and pressures, reported in many of the experiments, generally favored the socialized-recitation as a teaching method. Cronbach stressed the importance of active participation by the students in tasks such as locating and evaluating information.[2] Both the lecture and socialized-recitation instruction methods permit the learner to perform some activities, but these are of different kinds. The first required listening, thinking, organizing, and probably note-taking. The second made similar demands, but in addition, involved finding, reading, and evaluating information, and then discussing it with the teacher and classmates. The greater apparent activity of the socialized-recitation suggests that teaching could be more effective by this means.

Provision for periodic review, reinforcement, or feedback was recommended by Horwitz.[3] The repeated contact of the student with

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[1] Bining and Bining, _op_. _cit_., pp. 137-38.

[2] Lee J. Cronbach, Educational Psychology (New York: Harcourt, Brace and Company, 1954), p. 12.

[3] _National Society for the Study of Education_, _The Dynamics of Instructional Groups_ (Chicago: University of Chicago Press, 1960), p. 220.

the material in the variety of activities in socialized-recitation suggests that learning could be more effective by this means.

Stovall claimed that socialized-recitation offered more provision for individual differences.[1] However, the homogeneous grouping of classes in the present experiment suggested that the importance of providing for individual differences would be less than where heterogeneous classes are used.

In the present study, the criterion for preferring one teaching method to the other was that students learned more facts or developed better understanding, although the changes in students' attitudes effected by both methods were also compared. Pupil attention in class, or attitude toward the learning process, may lead indirectly to greater gain scores but were not directly measured.

SUMMARY

Several important conclusions, related to the present study, were drawn from these reported experiments.

1. If the teacher were to direct all activities, greater efficiency might result, but resentment and lack of interest might also result.

2. Social pressures increased where pupils shared in the formation of plans, and could be used to motivate and to shape attitudes.

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[1] Stovall, _op_. _cit_., pp. 255-58.

3. Efficiency in a learning situation was obtained by some sacrifice in social interaction, and therefore of possibilities for attitude formation.

4. Learning and personality theory support the socialized-recitation teaching method, but homogeneous grouping of students, or differences in subject-matter content and organization, or in teacher ability or preference, could minimize these theoretical advantages.

CHAPTER IV

CONDUCTING THE EXPERIMENT

School Organization

This experiment was conducted with grade eleven classes at Ross Sheppard Composite High School, Edmonton, Alberta. The usual organization of the school was used, with classes grouped into academic, general, and business education programs. Within programs, students were grouped according to their grade ten academic averages (arithmetic means). Although differences in ability or aptitude for a particular subject could not always be controlled, the classes were comparitively homogeneous.

The experiment was conducted during the interval between the October and Christmas examinations, in 1960. Units two and five of the Social Studies 20 course were taught during the experiment.[1]

Selection of Classes

Five teachers undertook to teach in the manner required by the experiment. Eight of the sixteen classes of Social Studies 20 were used in the experiment. After the students' average marks for the previous year had been calculated, and used as a basis for ranking the classes in order, two of the four classes in each quartile were

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[1] Senior High School Curriculum Guide to Social Studies 10, 20, and 30 (Province of Alberta: Department of Education, 1955), pp. 74-79.

selected for the experiment on the basis of their teachers' willingness to cooperate. In the following ranked list of Social Studies 20 classes, those underlined were used in the experiment:

1 2 *3* 4 *5* *6* 7 8 *9* *10* 11 12 13 *14* *15* 16

Preparation for the Experiment

Selecting the Units

Units two and five from the *Senior High School Curriculum Guide for Social Studies 10, 20 and 30* were selected for the experiment. Their subject matter was the history of industrialization and the accompanying social changes.[1]

Preparing the Test

A test was prepared covering the material of the two units.[2] An outline of daily lesson plans for both units was prepared, and the same number of questions were constructed for each class period. Each item could therefore be associated with one of the units, even if the lesson plans were not rigidly adhered to in every classroom. The types of questions included were: (1) multiple-choice, (2) matching, (3) completion, (4) short answer, and (5) attitude response. Several extra questions were prepared. Remmers' suggestions for constructing educational tests were followed.[3]

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[1] *Ibid.*

[2] *Infra*, pp. 59-73.

[3] H. H. Remmers, et al., *A Practical Introduction to Measurement and Evaluation* (New York: Harper and Brothers, 1960), pp. 234-36.

The consensus of three classroom teachers and two members from the thesis committee were used to establish (a) validity of content throughout the test paper, and (b) to separate 'fact' items from 'concepts'. Several revisions were made and unsatisfactory items were discarded.

It was initially planned to conduct the experiment with only superior students, and a difficult test was prepared. Administrative necessities and the advice of members of the thesis committee resulted in classes of all abilities being included. However, the test was not revised, and would therefore be regarded as too difficult for ordinary evaluation, except for classes of superior students.

Establishing Uniform Method

Descriptions of the two methods of teaching, developing contrasts between them, and outlining desirable procedures, were prepared in an effort to secure uniform methods. These descriptions[1] were given to the participating teachers. Later a meeting was called to discuss the experiment, to describe the methods of teaching and to answer the questions of the teachers involved.

A check list was given to the teachers so that they could report on their teaching methods for each area of content.[2] Each teacher was given a sufficient number of outlines of the content for each unit for

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[1] *Infra*, pp. 53-54.

[2] *Infra*, p. 55.

every student in his class.[1] In addition, the Curriculum Guide for Social Studies 20 was available to each teacher.

Administering the Pre-Test

The whole test battery, which would have required slightly more than one hour to administer, was broken into two halves and administered during the first period of November 1 and November 2, 1960, by the home room teachers of the classes involved. The teachers were asked to advise the pupils that this test was designed to find out what they knew about the subject before they had studied it in school, and that they should not be disturbed if their score seemed low. They were told that the results of the test were to be used by the University. No serious problems developed. The completed papers were then filed unmarked until completion of the experimental situation.

Experimental Design

The experiment was to be conducted by using a pre-test, followed by controlled teaching and a post-test. The rotational design advocated by Best[2] was used, so that four of the eight classes were taught Unit II by one method, the lecture method, four were instructed by a second procedure, socialized-recitation. For Unit V the methods were reversed. In this way, it was assured that each method would be used for teaching each class, for each unit, and in both first and second order. The arrangement used for the experiment is summarized in Table 1.

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[1] Infra, pp. 56-57.

[2] John W. Best, Research in Education (Englewood Cliffs, N. J. Prentice-Hall, Inc., 1959), pp. 135-36.

TABLE I

ORGANIZATION OF THE EXPERIMENT

Classes in Rank Order	Teacher	Unit II	Unit V
		Teaching Method	Teaching Method
1	A	L.[1]	S. R.
3	B	S. R.[2]	L.
5	B	L.	S. R.
6	C	S. R.	L.
9	C	L.	S. R.
10	D	S. R.	L.
14	C	L.	S. R.
15	E	S. R.	L.

Only the underlined classes were reported in the final results (*Infra.*, p. 37).

[1] Lecture

[2] Socialized-Recitation

Conducting the Experimental Teaching

All of the teachers reported similar teaching procedures in conducting the experiment. An account of methods used by the experimenter is given for illustration.

The lecture unit was introduced to the students after distributing the outline of the required subject matter. It was related to material studied in previous years and to current developments. The outline was carefully followed, giving an exposition of the work of various men, and the significance of various epochs. Comparisons were drawn among countries and between different eras to show the transfer and adoption of ideas of one society by another. The important theories related to the work were introduced and illustrated from actual events.

Patterns of today's society were related to the concepts developed in the unit. An attempt was made to keep the material interesting or even colorful. However, almost all of the questions were asked by the teacher and answered by the pupils. No attempt was made to refer the students to source materials. The pupils were not expected to prepare any assignments, but were required to keep adequate notebooks on the work. When two classes of different ability were taught by the lecture method, the information presented was more detailed and particular, the theory more technical, and the number of comparisons greater for the more able class. The duration of the teaching was controlled so that one half of the available time was used for the first unit of the experiment.

In the socialized-recitation classes, the outline of the material was given to the students, together with a list of books from the library that dealt with the unit. Students were then asked to choose topics for preparation of reports and for discussion of their information with the class. Five or six groups, each of four to six members, were organized by the students. A chairman and secretary for each committee were chosen by its members. One of the students, acting as a secretary for the class, noted the topics undertaken by each group. For approximately three days, the students compiled information for their group reports. Each committee subdivided its work, and had one or two members investigate a particular phase. The organization of these reports into a related whole was undertaken by the group, which group also decided the manner of presentation to the class. One committee duplicated material, so that other members of the class did not need to take notes and could attend more closely to the report. Usually students read or delivered their material from an outline that they had placed upon the blackboard before class. They then answered questions. The accuracy, lucidity, and completeness of the reports varied considerably. Discussion following the reports ranged from student attempts at clarifying facts or ideas which had not been understood, to attempts at generalizing from the report or relating it to others.

Enthusiasm was moderately high, and because no difficulties were encountered, it was possible to study most of the work of each unit by either method. Students worked willingly by both methods, but appreciated the change for the second unit.

Evaluation

Post-test

The complete test was separated into two sections (as the pre-test had been) so that it could be administered in two separate periods. It was necessary to conduct the tests during the regular social studies periods rather than at the same time as suggested in the Rockwell technique reported by Melby and Lien.[1]

Marking Procedures

Marking keys were prepared and the tests marked separately for each unit and type of question. Subjective questions were marked from a key prepared after a number of the papers had been read so that the answeres could be ranked. The best answers received perfect or nearly perfect marks, while the poorest answers received few. Only completely incorrect answers or blanks were given no marks.

The attitude scores were prepared by dividing the questions into six areas, which areas determined the students' attitudes toward the labor movement, equalizing of incomes, government influence of health programs and population control, preferential hiring by employers, and degree of liberal or socialist profession. It should be noted that all of these areas are the subject of historical discussion in Unit Five of the _Senior High School Curriculum Guide for Social Studies 10, 20, and_

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[1] E. O. Melby, and A. Lien, "A Practical Technique for Determining the Relative Effectiveness of Different Methods of Teaching", _Journal of Educational Research_, XIX:255-264, April, 1929.

30 (1955).[1] A numerical scale was then used to study changes in the students' attitudes between the pre-test and post-test.

Rejection of Uncontrolled Information

It was necessary to eliminate from the experiment the results of four of the eight classes. One teacher taught the socialized-recitation for one unit, while a practice teacher did all the lecturing for the other unit. Two teachers did not complete the second set of examinations until after the Christmas examinations and vacation. Classes 1, 3, 5, and 15 shown in Table I (page 32) were therefore not included in the analysis.

Several students' results were discarded because: (1) they had been absent for one of the test days, or (2) they had been observed cheating.

The effect of discarding these results was to reduce the numbers of students reported from nearly two hundred to sixty-eight, with no classes of superior students in the reported results.

Statistical Treatment

The formulae for significance of differences between two means for independent samples were used. These formulae were

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{(S^2/N_1) + (S^2/N_2)}}$$

where $$S^2 = \frac{\sum(X_i - \bar{X}_1)^2 - \sum(X_i - \bar{X}_1)^2}{N_1 + N_2 - 2}$$ [2]

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[1] Curriculum Guide, op. cit., pp. 74-79.

[2] George A. Ferguson, Statistical Analysis in Psychology and Education (Toronto, McGraw-Hill Book Company, Inc., 1959), pp. 136-38.

CHAPTER V

CONCLUSIONS, INTERPRETATIONS, AND IMPLICATIONS

Results from the Experiment

The first hypothesis, "that there is no significant difference in the relative effectiveness of the lecture and socialized-recitation as a method of presenting facts in the social studies", was rejected.[1] It was found that lecturing is more effective to a degree significant at the .001 level. A two-tailed t-test was used to test the significance of the difference in means of the gain in scores from a pre-test to a post-test.

The second hypothesis, "that there is no significant difference in the relative effectiveness of the lecture and socialized-recitation as a method of developing understanding in social studies", was not rejected. There was no significant difference between the two methods in this respect.

The third hypothesis, "that there is no significant difference in the effect of the two methods upon students' attitudes toward the political right or left", was not rejected. Socialized-recitation produced a small left wing tendency, and lecture produced a small tendency to the right, but the difference was not significant at the .05 level.

Further analysis was made of the relative effects of the two teaching methods upon students' attitudes toward the following matters: the labor movement; government regulation of incomes; economic

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[1] _Infra_, Tables II, III, and IV; pages 39-41.

laissez-faire; state intervention in health, family control, or immigration patterns; and preferential or discriminatory treatment by employers. None of these differences proved to be significant at the .05 level.[1] A summary of the findings of the experiment is reported in Table II, and the data are summarized in Tables III and IV.

Interpretations

In this experiment, the .05 level of confidence was adopted as a measure of significant difference. Smaller differences would be regarded as possible chance selection of a non-random sample. These differences would be discarded as non-significant, and the hypothesis being tested would be maintained. This choice of confidence level was arbitrary,[2] and could lead to rejecting hypotheses which are true, or to failing to reject those which are false.[3]

A further consideration is the size of the sample used in the experiment. Travers stated that unless the difference is large enough to prove significant with as few as fifty cases in the sample, it would not be of practical value.[4] In this experiment, the sample size was sixty-eight. Under these conditions, any differences found to be significant would probably be useful.

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[1] *Infra*, pp. 39-41.

[2] William S. Ray, *An Introduction to Experimental Design* (New York: The Macmillan Company, 1958), p. 85.

[3] Allen L. Edwards, *Experimental Design in Psychological Research* (New York: Rinehart and Company, Inc., 1951), p. 29.

[4] Robert M. W. Travers, *An Introduction to Experimental Research* (New York: The Macmillan Company, 1958), p. 356.

TABLE II

SUMMARY OF RESULTS OF THE EXPERIMENT

HYPOTHESIS	DIFFERENCE	SIGNIFICANCE LEVEL
There is no significant difference between the two methods for:		
1. presenting facts	Lecture superior	Significant
2. developing understanding	Socialized-recitation superior	Not Significant
3. influencing attitudes toward		
(a) the economic or political left	Socialized-recitation had greater effect	Not Significant
(b) sympathy toward the labor movement	Socialized-recitation had greater effect	Not Significant
(c) approval of government equalizing of incomes	Practically none	
(d) approval of government control of business	Lecture had greater effect	Not Significant
(e) approval of government influence of health, population and immigration	Socialized-recitation had greater effect	Not Significant
(f) approval of employment preferences to minimize social hardship	Practically none	

TABLE III

SUMMARY OF DATA

Facts and Concepts

HYPOTHESIS	MEAN in GAIN SCORES		TEST OF SIGNIFICANCE OF DIFFERENCE BETWEEN TWO MEANS FOR INDEPENDENT SAMPLES[1]	
There is no significant difference between the two methods for:				
	Lecture	Socialized-Recitation	t Value	Significance
1. Presenting facts	6.982	3.101	4.911	.001
2. Developing understanding	.7353	1.4853	.690	--

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[1] George A. Ferguson, Statistical Analysis in Psychology and Education (Toronto, McGraw-Hill Book Company, Inc., 1959) pp. 136-38.

TABLE IV

SUMMARY OF DATA

Attitudes

HYPOTHESIS	MEAN CHANGE IN SCORES POST-TEST MINUS PRE-TEST		TEST OF SIGNIFICANCE OF DIFFERENCE BETWEEN TWO MEANS FOR INDEPENDENT SAMPLES[1]	
There is no significant difference between the two methods for influencing attitudes[2] towards:	Lecture	S. - R.	t	level/significance
1. the economic or political left	-.4706	.6177	1.47	.2
2. sympathy toward the labor movement	-.1176	.6176	1.32	.2
3. approval of government equalizing incomes	-.1176	-.0882	--	Not Sig.
4. approval of government control of business	-.6764	-.0588	1.58	.2
5. approval of government influence of health and population limitation	-.7648	.2353	1.51	.2
6. approval of employment preferences to minimize social hardship	.4412	.4118	--	Not Sig.

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[1] George A. Ferguson, Statistical Analysis in Psychology and Education (Toronto, McGraw-Hill Book Company, Inc., 1959) pp. 136-38.

[2] Positive change scores in all attitudes tests indicate a change toward the political-economic left.

Best regarded the rotational method used in this experiment as a good procedure to minimize the uncontrolled or uncontrollable factors in classroom experiments. He claimed that the variables were controlled experimentally, rather than by statistical procedures.[1]

Other opinions have been included for the reader's consideration. McGuigan cautioned against the use of the rotational method, which he called counter-balancing. He doubted the validity of the assumption that the interaction between the first treatment and the second would be the same (would counter-balance) if the order of the treatments were reversed for half of the cases.[2]

R. A. Fisher criticized excessive attempts to isolate various components of situations through the refinement of experiments into fragmentary units and dutifully testing each of these parts with a matched group procedure. He considered that the results of such research were not very useful, and preferred to study all factors at work simultaneously, rather than those which could be isolated easily.[3]

The results of this experiment should be applicable to schools of similar size and organization,[4] where student populations are similar to those used in the experiment. This study was conducted with classes of homogeneously grouped students of average or below average ability

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[1] John W. Best, Research in Education (Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1959), pp. 135-36.

[2] Frank J. McGuigan, Experimental Psychology, A Methodological Approach (Englewood Cliffs: Prentice-Hall, Inc., 1960), pp. 114-115.

[3] R. A. Fisher, The Design of Experiments (New York: Hafner, 1949), pp. 91-92.

for high schools.[1] Classes were selected in the usual way for the school used in the experiment.[2]

Some of the important limitations for the conclusions are summarized here.

1. It must be assumed that the methods actually used by the teachers were those required by the experiment.

2. The rotational design requires the use of a post-test after the first unit as well as after the second unit. However, if it could be shown that the combined post-test after the second unit did not favor either method, this requirement would be met. There are two factors that probably indicate the results did not meet requirements. First, the two parts of the test (Unit I and Unit V) were probably not of equal difficulty; and second, the higher ability students (if the rank order for achievement also indicated the ability ranking) used the lecture method immediately before the post-test.

3. Interaction between the first method and the second must be assumed to counter-balance when the order of the teaching methods is reversed.

4. It must be assumed that the time of day when teaching or testing took place had no effect upon the results.

5. Practice effects, resulting from using the same test both before and after the teaching, must be assumed to favor neither method.

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[1] _Supra_, pp. 3-4, 29.

[2] _Supra_, pp. 29-30.

All but item 5 in the above list are assumptions implicit in the choice of rotational design. It seems likely that those most likely to decrease the confidence with which one might accept the results would be items 2 and 3. They are probably important enough that the confidence usually associated with the .001 significance level should be treated with reservation.

The teaching implications are less obvious. Lecturing was found to be superior as a means of imparting facts. Neither method proved significantly better for developing understanding. Socialized-recitation had only slightly greater effect upon students' attitudes than did lecturing. It resulted in the students becoming more "left-wing" in their responses to the items included in the test, but the difference was not significant. The literature reviewed gave no indication that it was likely for these objectives to be separated in the teaching of social studies. The superiority of either method was not tested after a longer period of time, to determine the retention of knowledge, understanding, or the acquired attitudes.

The comparison of the effect of the two methods of teaching upon students' attitudes was probably the most important result of the study. The Likert scales were shown to be useful. However, the items included in the test would probably produce relatively strong reactions, possibly exaggerating the results. There was probably no basis for concluding that a study of the history of social and political changes by either the lecture or the socialized-recitation method would induce a change in students' attitudes toward either the political left or right. However, Likert scales could be developed for

those areas where it is desired to determine the effects of the teaching upon the students' attitudes.

The changes in attitude scores from pre-test to post-test were tested for significance. The difference between means for correlated samples was used where

$$SD^2 = \frac{\sum D^2}{N} - \bar{D}^2 \qquad t = \frac{\bar{D}}{\sqrt{SD^2 / (N-1)}}$$ [1]

None of the changes were large enough to be significant at the .05 level. This may have been due to the small number of questions in each section of the attitude tests. The very coarse measure available was probably not well suited to this test.

The relative merits of the two methods, from the results of this experiment, may be summarized as follows: (1) lecturing probably develops short-term knowledge of facts, (2) the two methods are not significantly different in their usefulness for developing understanding of principles, and (3) the two methods tend to produce different effects upon students' attitudes, with the socialized-recitation producing pro-left responses but of a degree not found significant in this experiment. The literature reviewed for this study would suggest that the findings are consistent with those of earlier experiments in educational and psychological theory.[2]

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[1] George A. Ferguson, *Statistical Analysis in Psychology and Education* (New York: McGraw-Hill Book Company, Inc., 1959), p. 138.

[2] *Supra*, pp. 3, 19-27.

Recommendations for Further Study

This experiment suggested several possibilities for further study. The writer believes that the rotational method introduces many statistical variables in its attempt to counterbalance experimental variables. It is not ideal for classroom experiments.

The pre-test, post-test method of comparing teaching methods has been frequently used. Probably a study of attitudes would require a more detailed scale, so that scores would be larger and the differences would likely be more easily interpreted. It seems unlikely to the author that an attitude scale will be developed that will be suitable for rigorous statistical treatment, because the results are obtained in ordinal, not cardinal, numbers. Unfortunately this is true of most of our educational tests.

Future experiments should try to define clearly the nature of a concept. It seems possible that the concept may have been very narrowly separated from fact in this study. Perhaps questions may be more easily asked about facts that illustrate concepts than true concepts. The system of classifying items suggested by Bloom might prove to be satisfactory in this regard.[1]

The Likert attitude scale seems to be relatively easy to construct, but future studies should include only attitudes which teachers will agree are desirable. For example, many controversial political views would have to be eschewed. A large number of responses should then be prepared to make the results more readily interpretable.

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[1] Benjamin Samuel Bloom, *Taxonomy of Educational Objectives, The Classification of Education Goals* (New York: Longmans, Green, 1956).

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APPENDIX A

APPENDIX A

THE EXPERIMENTAL SITUATION

1. Instructions to Teachers

The following outline has been prepared to help you distinguish between the two teaching methods required in this experiment. It is important to adhere closely to these instructions.

(a) Lecture

- (i) Information should be organized and presented by the teacher.
- (ii) Pupils should not be required to read or prepare information, although if they wish to read more on a topic of interest to them, the information should be available.
- (iii) Teachers may question students or develop discussion in order to ensure a clear knowledge of the required material.
- (iv) Essays or other forms of evaluation may be used.

(b) Pupil Report: Socialized-Recitation

- (i) Information should be made available in books or other forms.
- (ii) Required subject areas should be outlined for the pupils.
- (iii) Pupils should organize committees and, in them, determine how to find, organize and present information.

(iv) Pupils should be encouraged to discuss significant issues among themselves.

(v) Evaluation should reflect the interest in developing the skills of investigation as well as mastery of subject matter.

(c) Point of View

Please give your reaction to the following questions:

(i) How do you feel the social studies compares with the traditional history and geography courses in value to the students?

(ii) What methods do you use most commonly in your teaching? Why have you preferred this method?

(iii) What other methods have you tried and found reasonably satisfactory? What were their best features?

(iv) What is your reaction to teaching for approximately fifteen classroom days by only one method?

2. Teachers' Control Chart

Date ____________________ Class ____________________

Subject Area Covered Time Method of Instruction

1. Lecture
2. Class discussion - Teacher-led
3. Pupil Committee work
4. Class Reports
5. Pupil directed discussion
6. Other

(Check those methods used)

Comments on the extent to which pupils initiated or directed the learning activities:

Names of pupils who have done an outstanding amount of work in connection with the lesson:

Pupils' name(s) Material presented

1.

2.

3.

4.

3. Outline of Content for Student Use

Students' Outline of Material Required in Unit Two--"The Effect of Science on Our Economic Life"

1. The Nature of Feudal Economy.
    - (a) Feudal employment patterns and control of working situation.
    - (b) Trend from owner craftsmen to factory worker production.
2. The Industrial Revolution.
    - (a) Textile revolution.
    - (b) Mechanical power.
    - (c) Improved metal manufacturing.
    - (d) Improvements in transportation.
    - (e) Improved communication.
3. The Agricultural Revolution.
    - (a) Classic British revolution.
    - (b) Mechanization in America.
4. Economic Organization Today.
    - (a) Spread of industrialism.
    - (b) Rival economic systems.
5. Economic Principles.
6. Terms.

Students' Outline of Material Required in Unit Five--"Social Enlightenment and Reform"

1. Medieval social agencies: church, guild, family.

   Education, care for sick and needy.

2. Decline of medieval institutions. Rise of state as a social agency.

3. Factory movement and industrialization.

4. Moral versus economic forces.

   (a) Erasmus
   (b) More
   (c) Hobbes
   (d) Locke
   (e) Malthus
   (f) Voltaire
   (g) Diderot
   (h) Rousseau
   (i) Marx
   (j) Engels

5. Leaders in reform.

   (a) Factory reforms: Owen, Shaftesbury, Wilberforce.

   (b) Educational.

   (c) Health: Nightingale, Dunant, Pasteur, Jenner, etc.

   (d) Penal: Peel, Howard, Fry.

   (e) National: Napoleon, Bismarck.

6. Today's Problems.

7. Terms.

APPENDIX B

APPENDIX B

TEST USED IN THE EXPERIMENT

NAME ______________________________

HOME ROOM __________ DATE ___________

A. INSTRUCTIONS TO STUDENTS:

ON THE BLANK AT THE RIGHT MARGIN, WRITE THE NUMBER OF THE ITEM IN THE LEFT HAND COLUMN THAT CORRESPONDS MOST CLEARLY WITH THAT IN THE RIGHT HAND COLUMN. USE EACH NUMBER ONLY ONCE.

OBJECTS OF TEXTILE INVENTIONS

1. The mailbag stitch was mechanically duplicated.
2. Two earlier spinning inventions were combined.
3. A means was found for avoiding hours of slave labor when preparing cotton.
4. The use of rollers for spinning was adopted from an earlier invention.
5. The invention imitated an upset spinning wheel.

INVENTORS

Richard Arkwright ________

Eli Whitney ________

Samual Crompton ________

James Hargreaves ________

John Kay ________

Edmund Cartwright ________

Elias Howe ________

IMPROVEMENTS IN TRANSPORTATION

6. A toll system for hauling freight cheaply.
7. A way for treating earth for roads used by heavy vehicles.
8. A British road system that was given government support.
9. A private freight system used to assure delivery.

MAN RESPONSIBLE

Josiah Wedgwood ________

George Stephenson ________

John MacAdam ________

Thomas Telford ________

Duke of Bridgewater ________

Mathew Boulton ________

REASON FOR CHANGE IN FARMING METHODS

10. Mendel's laws of heredity suggested new approaches.

11. A study of continental farm practices suggested better methods for the English to use.

12. The problem of farming sandy wasteland was undertaken.

13. Summerfallow seemed to waste time and land.

NEW DEVELOPMENT

row cropping ________

crop rotation ________

enclosure movement ________

Annals of Agriculture ________

strip farming ________

meat livestock ________

DESCRIPTIONS

14. This process was developed because Britain's hardwood forests were nearly gone.

15. This improvement in an older steel-making process is still the most important.

16. This discovery began the age of steel.

17. This discovery made possible our whole machine industry.

PROCESSES

Thomas-Gilchrist open-hearth furnace ________

Maudslay fixed-bed process ________

Wilkinson cannon borer ________

Darby's coking process ________

Bessemer converter ________

Onions-Cort puddling furnace ________

DESCRIPTIONS

18. This invention caused a great increase in the speed of large ships.

19. This made possible an increase in the size of ships.

20. This design enabled contracts to be won by speed.

21. Seaworthiness of ships advanced by this invention.

IMPROVEMENT

screw propeller ________

Yankee clipper ________

stern paddle wheels ________

steam turbine ________

diesel power ________

steel ship ________

	INVENTIONS	INVENTORS	
22.	The first commercially practical "internal combustion" engine.	Mathew Boulton	________
		Gaston Chevrolet	________
23.	The direct forerunner of today's car engine.	Nicholas Cugnot	________
24.	The famous crude oil engine.	Lenoir	________
25.	The first powered road vehicle.	Rudolf Diesel	________
		Gottlieb Daimler	________

	INVENTIONS	INVENTORS	
26.	The plow that made prairie farms possible.	Henry Ford	________
		Hart Massey	________
27.	Canada's first hay and harvest machines.	John Deere	________
28.	The reaper that enabled American farms to grow in size.	Benjamin Holt	________
		Cyrus McCormick	________
29.	The implement hitch used in 50% of the tractors built today.	Harry Ferguson	________
30.	The tractor that became the standard for construction work.	J.I. Case	________

	RAILWAY SYSTEM	COUNTRY	
31.	A world famous "spider-web" railway.	Russia	________
		Britain	________
32.	A railway to every community.	Germany	________
33.	The longest railway ever built.	United States	________
34.	The first system of private railways giving national coverage.	Switzerland	________
		France	________

DEVELOPMENT

35. The first brief powered flight was made without a pilot.

36. The helicopter is his most important work.

37. Famous maker of dirigibles.

38. A designer of rockets for military and space vehicles.

INVENTOR

Igor Sikorosky ________

Ferdinand Zeppelin ________

S.P. Langley ________

Glen Curtis ________

Verner von Braun ________

Glen L. Martin ________

SIGNIFICANT STEPS LEADING TO PRACTICAL DEVELOPMENTS

39. The most important cost analysis in the history communication showed the best procedure.

40. An accident in a series of experiments led to success.

41. Development of a code was an essential forerunner of the invention.

42. An accidental photograph led to the initial discovery.

INVENTOR

Heinrich Hertz ________

William Roentgen ________

Rowland Hill ________

A.G. Hill ________

Samuel Morse ________

Lee de Forest ________

MEDICAL DEVELOPMENT

43. Vaccination against smallpox.

44. Inoculation against diphtheria.

45. Elimination of yellow fever.

46. Inoculation against polio.

INVENTOR

Robert Koch ________

Louis Pasteur ________

Edward Jenner ________

Walter Reed ________

Jonas Salk ________

James Simpson ________

B. MULTIPLE CHOICE.

AFTER EACH OF THESE STATEMENTS, FOUR OR MORE POSSIBLE COMPLETIONS ARE LISTED. CHOOSE THE BEST ONE AND MARK ITS LETTER AFTER THE CORRESPONDING NUMBER ON THE RIGHT MARGIN.

47. Robert Owen did not attempt:

(a) to increase his workers' education. 47________
(b) to increase his workers' wages.
(c) to shorten working hours.
(d) to provide stores where workers could buy his goods.
(e) to compel other manufacturers to do as he did.
(f) to start a political party for reforming Britain.

48. Florence Nightingale's work seems to be remembered because: 48________

(a) she saved the lives of thousands of soldiers in the Crimean War.
(b) she aroused the need for better hospitals.
(c) she glamorized the previously disdained occupation of nursing.
(d) she established the Red Cross.

49. Which two things did Rousseau advocate primarily? 49________

(a) equal rights in politics and penal reform.
(b) penal reform and agnosticism in religion.
(c) unrestrained school atmospheres and political equality.
(d) penal reform and educational liberty.
(e) elimination of religion in schools, and penal reform.

50. The industrial revolution did not cause: 50________

(a) severe economic competition among nations.
(b) the rise of a new class called capitalists.
(c) a greater independence of workers.
(d) an ultimate rise in the standard of living.

51. Thomas Hobbes' reason for advocation of improved social conditions was that: 51________

(a) he felt that the government had a responsibility to poor people.
(b) he felt the Christian approach was being neglected.
(c) he saw no reason why poor people should obey a government that did nothing for them.
(d) he was a poor person himself and therefore knew true conditions.

52. The idea of free school tuition, state supported but with independent instruction is found best in: 52______

(a) Canada (b) Britain (c) Germany (d) Russia

53. The best example of government control in Canadian industry is found in the production of: 53______

(a) oil (b) steel (c) uranium (d) asbestos (e) gold

54. Which reason below does not explain why the first advance came in the cotton textile industry? 54______

(a) Wool was losing favor among the English people.
(b) Cotton was popular in the West Indies and the American colonies.
(c) British cotton production was undersold by that of India.
(d) British manufacturers were at first unable to make "100% cotton" goods.
(e) Cotton making was the easiest industry to mechanize.

55. The agricultural revolution: 55______

(a) followed the industrial revolution.
(b) finally put a stop to the enclosure movement.
(c) brought large numbers of persons to the farm.
(d) resulted in great injustices to farm owners.

56. Periodic unemployment and child labor: 56______

(a) began with the industrial revolution.
(b) ended with the industrial revolution.
(c) were common before factories and remained after the industrial revolution.
(d) were found mainly in the cities.
(e) were found mainly in the mining communities.

57. The effect of John Kay's invention was that: 57______

(a) most weavers were unemployed.
(b) most spinners were unemployed.
(c) the need for skilled weavers nearly doubled.
(d) a greater demand for spinners existed.
(e) only spinning machines could ever fill the need for thread.

58. The chief reason for the growth of London's population since 1750 has been: 58_______

(a) a rising birthrate.
(b) declining infant mortality.
(c) immigration from other countries.
(d) migration from rural to urban areas.

59. The industrial middle class seems to have been: 59_______

(a) wealthy men who became factory owners.
(b) shrewd business men who started with little wealth.
(c) men who were proud of their employee loyalty.
(d) men who were more interested in politics than in business.
(e) men who were responsible for many "showy" dwellings.

60. Child labor was eventually stopped because: 60_______

(a) their work was so poor.
(b) their daily output was too low.
(c) their wages rose to nearly that of adults.
(d) the Factory Act was passed.
(e) inspectors enforced government regulations.

61. A person not concerned with changing labor conditions was: 61_______

(a) Shaftesbury
(b) Disraeli
(c) Wilberforce
(d) Lord Durham
(e) Brougham

62. Which of the following items is not in correct order? 62_______

(a) feudal system
(b) cottage industries
(c) factory systems
(d) mass production
(e) putting out system

63. Joseph Lister became medically famous for: 63_______

(a) learning that bacteria in wounds could be killed with carbolic acid.
(b) learning how bacteria could be prevented from entering wounds.
(c) the development of ether so operations were painless.
(d) dissecting corpses dug up after burial.
(e) developing sulpha drugs.

64. The industrial revolution in Britain affected Canada in all but one of these ways: 64________

(a) by supplying manufactured goods cheaply.
(b) by providing a market for foods.
(c) by tending to prevent industry from growing in Canada.
(d) by increasing the number of immigrants.
(e) by increasing total trade.

65. Lord Shaftesbury's work is chiefly associated with reforms in all these respects except one: 65________

(a) moving machines were to be shielded for safety.
(b) working hours were to be reduced.
(c) schools were to be provided for employees' children.
(d) children were not allowed to work in the mines.

66. Which of the following items does not illustrate the same principle? 66________

(a) Roads in Canada typically rise and fall with the landscape.
(b) The French are tunnelling through Mont Blanc.
(c) American railways often followed the buffalo trails.
(d) Roman road builders followed river courses.

67. Governments may introduce desired changes in an attempt to increase or prolong their power. Which of the following is not an example of this type? 67________

(a) Bismarck introduced workmen's compensation.
(b) Napoleon advocated universal education.
(c) Gladstone began British national education.
(d) Castro seized plantations to give to the tenants.

68. Canada probably can expect the most severe competition in the textile industry from: 68________

(a) The United States.
(b) The United Kingdom.
(c) France.
(d) Italy.
(e) Hong Kong.

69. The U.S.A. can probably expect the most severe competition in manufacturing large airliners from: 69________

(a) Great Britain
(b) West Germany
(c) The Soviet Union
(d) Japan
(e) Canada

70. Most socialists would oppose: 70 ______

(a) medical insurance programs.
(b) university fees paid by industry and scholarships.
(c) railways, steel and oil production run by the governments.
(d) abolition of property taxes.

71. The general purpose of socialism is: 71 ______

(a) to have every person own his own business.
(b) to make everyone into a government employee.
(c) to assure that businessmen do not exploit employees' labor.
(d) to eliminate businesses that are unprofitable.
(e) to end state interference with the business world.

72. Unions, as a whole: 72 ______

(a) will ruin their company to secure better wages.
(b) encourage changes in working methods.
(c) generally want the government to side against employers.
(d) generally try to ensure their future by improving the market conditions for their industry.

73. Which of the following items does not belong in this group? 73 ______

(a) rent (b) wages (c) interest (d) profit
(e) taxes

74. The chief reason for the idea that the working man in the United States is not bound to work for any particular employer was: 74 ______

(a) the relative shortage of labor in the 19th century.
(b) the pressure of unions.
(c) a series of laws against employment discrimination.
(d) the absence of a traditionally privileged class of landowners.

75. Which of the following items does not belong in this group? 75 ______

(a) Navigation Acts
(b) Public Health Act
(c) Artisans' Dwellings Act
(d) Education Act
(e) Factory Acts

76. Reasons for international trade do not include: 76 ________

(a) a desire to help another country.
(b) the fact that each area is best suited to produce only certain goods.
(c) government resistance to local manufacturers.
(d) a desire to raise the standard of living.

77. The agricultural revolution made the greatest differences in: 77 ________

(a) the amount of food produced per acre.
(b) the amount of food each farm worker could produce.
(c) the quality of food produced.
(d) the total amount of food available.
(e) the price of food to the consumer.

78. The general spirit of penal reform was to win support from the people. Which of these changes does not seem consistent with this idea? 78 ________

(a) establishing an unarmed police force and making armed robbery punishable with the lash.
(b) making penalties very severe, forcing most criminals to reform.
(c) create a large number of policemen so that they are familiar to all.
(d) maintain only a few highly efficient police and depend on their skill.
(e) abolish the death penalty for virtually all offences.

79. Universal education began in Britain because: 79 ________

(a) Protestant churches insisted that everyone must read the Bible.
(b) it was necessary to keep children out of the factories.
(c) the government decided to enforce school attendance.
(d) people were demanding education for their children.
(e) the new monitor system of education did not cost much.

80. Karl Marx did not base his ideas upon: 80 ________

(a) the evil "sweat shop" conditions found everywhere in industrialized countries.
(b) the working conditions he found described in reports to the British government.
(c) the improved working conditions being introduced by some British industrialists.
(d) the idea of a class struggle involving workers and business owners.

81. Most of the industrial improvements of the last century came because: 81 ________

(a) the scientific method was being increasingly applied to problems.
(b) frequently a new concept was discovered by accident.
(c) the growing demand for goods required that new and better ways be found to produce them.
(d) there was such a labor shortage that women and children were forced to work for inhuman hours.

82. The industrial revolution in Britain was not caused by: 82 ________

(a) the demand of workers for better machines.
(b) an expanding population creating demand.
(c) British world trade outrunning production.
(d) increased attention to science leading to discoveries.

83. One of the following was not a result of the industrial revolution: 83 ________

(a) England experienced a great increase in wealth.
(b) other countries were prevented from copying the new machines.
(c) workers' wealth increased rapidly.
(d) Britain attempted to enlarge her colonial holdings.

84. The persons who suffered most from the industrial revolution were: 84 ________

(a) those who lived in small towns with only one industry.
(b) those who lived in great cities and worked in the factories.
(c) those who attempted to continue the skills that were being replaced by machine.
(d) those whose jobs were not regulated by the government.
(e) those who worked for small, new businesses.

85. Which of these ideas does not illustrate the concept that the governments have great responsibilities to the unfortunate members of society? 85 ________

(a) Most Alberta residents have M. S. I. hospital insurance.
(b) The Canadian government provides winter employment through a special program.
(c) The Central Mortgage and Housing Act limits the interest for mortgages on new houses.
(d) Family allowance cheques are paid to all mothers.

C.

1. Frequently two scientists working independently have arrived at substantially identical industrial processes at about the same time. Name a pair of these scientists:

______________________ and ______________________

2. Name the four factors of production. 1 ______________________

2 ________________ 3 ________________ 4 ________________

3. The early 19th century was marked by a sudden surge in population growth in Western countries. Why was this so?

____

____

4. Britain enjoyed a guaranteed market during much of the nineteenth century for reasons which differed from time to time. Choose one of these reasons and explain why it assured her markets.

____

____

5. In modern times, countries enter into various agreements that tend to assure economic cooperation. Explain how one of these economic agreements seeks to achieve this cooperation.

____

____

6. Many persons have been associated with advancing the economic positions of workers after the industrial revolution. Name one, and show how he sought to change conditions.

____

____

D. Write the terms defined here:

1. ______________________ the technical name for the class of enterprising business men who became the principal owners of wealth after the industrial revolution.

2. ______________________ the technical name for an association of apprentices, journeymen, and masters engaged in a common business in the period before factories.

3. ______________________ the correct name for the class of persons who concern themselves with the problems of underprivileged men in society.

4. ______________________ the name of the economic system that advocated private persons or groups of them should own all businesses.

5. ______________________ the name applied in Canada to a business that is completely owned by the government.

6. ______________________ the term implying that the government should not interfere with the workings of business.

7. ______________________ the correct name for business combinations, often international in scope, that attempt to limit competition among related businesses.

8. ______________________ the name applied to the relation between money received as wages and the cost of living.

9. ______________________ the name applied to an agreement between a firm and a union stating that only union members will be hired.

E. THERE ARE FIVE COLUMNS AT THE RIGHT OF THE FOLLOWING GROUP OF BIASED STATEMENTS. PLACE A CHECK MARK IN THE COLUMN THAT INDICATES YOUR REACTION TO EACH STATEMENT.

	STRONG DISAGREEMENT	PARTIAL DISAGREEMENT	NEUTRAL	PARTIAL AGREEMENT	STRONG AGREEMENT
1. Trade unions generally are trying to improve conditions, etc. of their members regardless of the result to management.					
2. The government should avoid adopting any socialistic ideas.					
3. It is a serious mistake for governments to allow companies to obtain equipment that is designed to replace workers.					
4. Progressive income tax, inheritance tax, and other leveling devices are justified in our society.					
5. No government supervision over profit margins is needed because of the highly competitive nature of today's society.					
6. The state should provide free compulsory education for all who would benefit from it.					
7. Voting privileges should be restricted to property owners.					
8. "Closed shop" contracts indicate a serious weakening of management's necessary control over its business.					

	STRONG DISAGREEMENT	PARTIAL DISAGREEMENT	NEUTRAL	PARTIAL AGREEMENT	STRONG AGREEMENT
9. Interest rates should be free to fluctuate according to the demand for loans.					
10. Since starvation, war and other forms of disaster await to destroy further increases in human population, marriage or birth rates must be sharply curtailed by the government.					
11. Workers must by closely supervised by their foremen in order to assure quality and speed in production.					
12. When unemployment grows to 5%, employers should give job preference to men.					
13. Family allowances are unnecessary.					
14. Students should not be given part-time jobs when unemployed adults might be given the work.					
15. Edmonton's water supply should be flouridated without a plebiscite.					
16. Canada's responsibility to over-populated areas included allowing immigration from these areas.					
17. Immunization against contagious and communicable diseases should be made compulsory.					

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